

SOLAR ENERGY APPLICATIONS OF OXOMANGANESE CATALYSTS ANCHORED ON A TITANIA NANOPARTICLE SURFACE

Gonghu Li, Clyde Cady, William McNamara, Robert Snoeberger, Christiaan Richter, Victor Batista, Charles Schmittenmaer, Robert Crabtree, and Gary Brudvig

Department of Chemistry, Yale University, New Haven, CT 06511

Oxomanganese complexes represent a key component of the oxygen-evolving complex of photosystem II. Here, we present our recent attempts to construct functional oxomanganese catalysts on the surfaces of titania nanoparticles. The oxomanganese catalysts are either directly supported on TiO₂ surfaces or anchored onto TiO₂ nanoparticles via novel organic linkers, and are characterized with microscopy, EPR, UV-vis, and IR spectroscopy. This combination of characterization allows for an improved understanding of interfacial electron transfer between the oxomanganese catalysts and the semiconducting titania support. Finally, the catalytic properties of our oxomanganese catalysts are evaluated for use in solar energy applications including the photoelectrochemical splitting of water.

